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2989

DIVISION Industrial Relations	DEPARTMENT Medical Department	SECTION Industrial Hygiene	BUILDING Bldg. 9706-2	ROOM 34
DESCRIPTION OF RECORDS		FROM	THROUGH	CODE NUMBER
Air Analyses, Reports, information, correspondence.		1953	1957	2000-1H-4 Y-12
Enclosed in box is a list of all folders included in the box.		APPROVED FOR PUBLIC RELEASE 2090-1H-4		
A through L		Technical Information Office / Date DOE Hold 1/31/7		
BOX NUMBER <u>1</u> OF <u>5</u>		LOCATION IN RECORDS CENTER		
CLASS OF FILE		Indef.	SECTION 20	TIER 9
RECORD <input checked="" type="checkbox"/> NON-RECORD <input type="checkbox"/>		RECORDS VERIFIED BY: Bill Everett		DR. 15 DATE 2/14/53

TRANSFER OF RECORDS

THE PORTER ARMY CENTER

INTER-COMPANY CORRESPONDENCE

(INSERT NAME) COMPANY CARBIDE AND CARBON CHEMICALS COMPANY LOCATION Post Office Box P
OAK RIDGE, TENN.

TO Edw. G. Struensee
LOCATION Bldg. 9202

DATE August 13, 1953

ANSWERING LETTER DATE

ATTENTION
COPY TO

File

SUBJECT Alpha Survey Program,
Y-12 Environs

On Wednesday morning, August 12th, members of the Health Physics Department met with Bob Myers to discuss the feasibility of setting up a permanent air sampling system at the Y-12 site in an effort to determine the general level of a air-borne particulate contamination. The following phases were discussed:

1. At least 8 sampling sites should be selected in and around the Y-12 site to give us fairly complete data on a air contamination.
2. If stacks are monitored regularly, about 4 sampling stations are needed. Stack monitoring is being considered by us at the present time.
3. Plan (2) is favored over (1) provided that we can sample stacks from production areas in a routine orderly manner.
4. Instrumentation is a vital problem. (I have taken the liberty to ask Ed Pflasterer to investigate this aspect of the overall program for us)
5. It appears that the actual level of a air contamination should be of a low order of magnitude and this in itself may be the dominant factor in determining the complexity of the instrumentation.
6. Bob Myers promised his office's cooperation in setting up a general plant wide monitoring system and coordinating micrometeorology with air analysis.

E. G. Struxness

-2-

August 13, 1953

I feel we have taken a step in the right direction. The second step involves a study of instrumentation with the idea of setting up a network of monitors with consideration centered on initial cost, operating cost, maintenance, complexity of system, sensitivity, and method of storing and recording data.

Original signed by W. H. Baumann

W. H. Baumann
Industrial Hygiene Section

WHB:cs

INTER-COMPANY CORRESPONDENCE

(INSERT NAME) COMPANY CARBIDE AND CARBON CHEMICALS COMPANY LOCATION Post Office Box P
OAK RIDGE, TENN.

TO Edw. G. Struxness
LOCATION Bldg. 9202

DATE September 1, 1953

ANSWERING LETTER DATE

ATTENTION

COPY TO File ✓

SUBJECT Outside Radioactive Particulate
Contamination in Y-12

The purpose of this report is to present information on the magnitude of radio-particulate contamination in the environs of the Y-12 plant. The following data are submitted on the outdoor air sampling program which began August 11, 1953.

Various types of filters and air sampling equipment were employed in the program. Four high volume air samplers, using 41 filter paper, were located at the following stations; South of building 9704-2, North of building 9404-5, East of building 9720-2, and West of 9929-1. These samplers were in operation for four days and nights. During the sampling period, the filters were changed at four hour intervals. Two Gast air samplers, using millipore filters, were located on the roof of buildings 9204-4 and 9202. One stationary air sampler, using 41 filter paper, was located West of building 9766. The three samplers are in operation currently.

During the period August 11, 1953 thru August 22, 1953, 110 analyses were made for beta-gamma and alpha air-borne activity. The average and median concentration of beta activity for the sampling period was 2.8 d/m/M³ and 1.9 d/m/M³, respectively. The average and median concentration for alpha activity was .3 d/m/M³ and .035 d/m/M³, respectively. During the sampling period for beta and alpha, the highest analyses reported occurred on August 13, 1953, (beta 19.0 d/m/M³ and alpha 15.9 d/m/M³). In both cases, the activity within a 24 hour period decreased considerably. Attached are histograms showing the distribution of the findings.

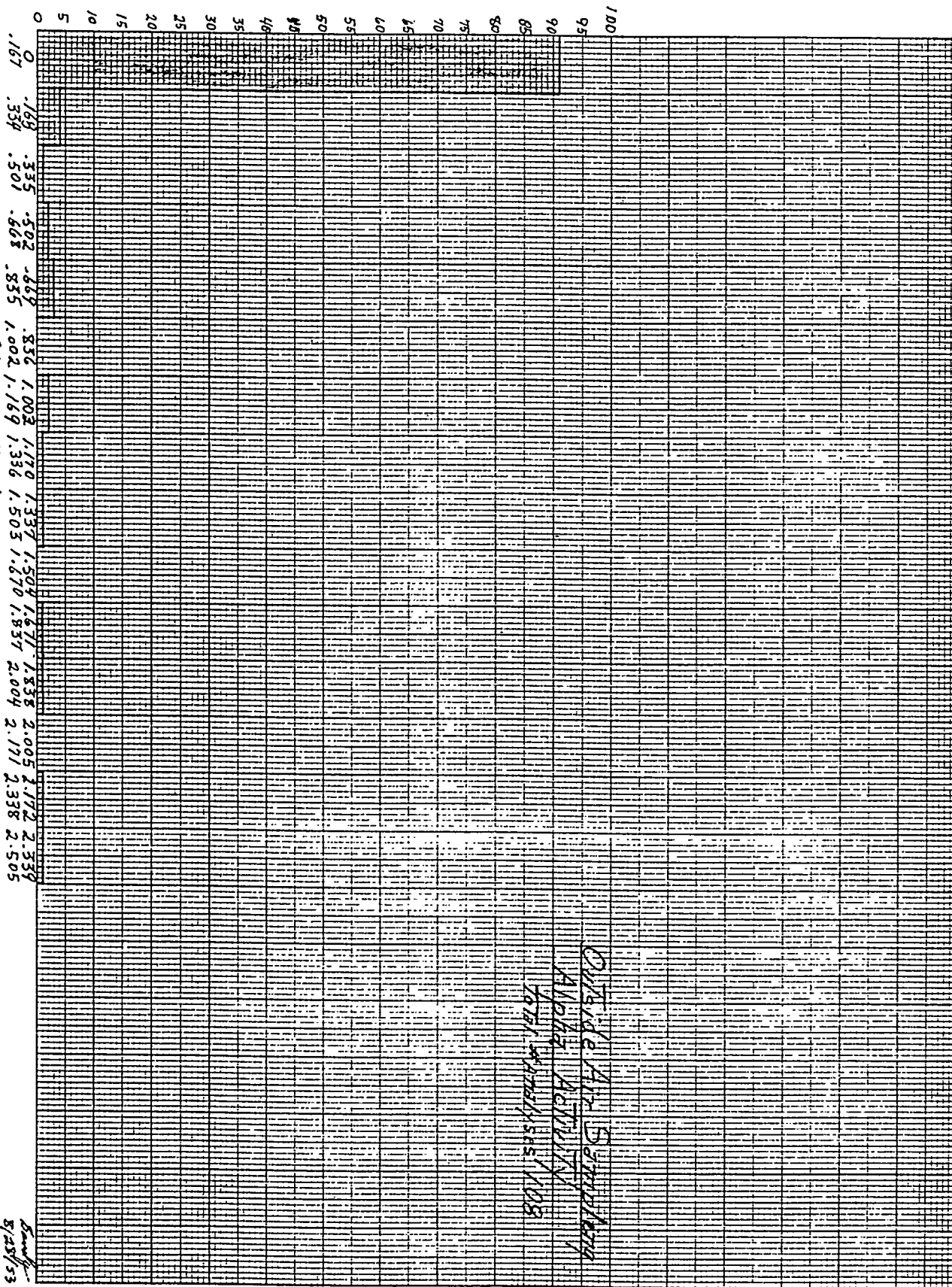
This program will be continued in an effort to learn more of alpha activity which could guide us in selecting instrumentation for the proposed outside air sampling program. Also the air findings at Y-12, obtained during the Spring tests at Nevada, shall be compiled and reported to see whether the present findings might indicate unusually high background.

Original signed by W. H. Baumann

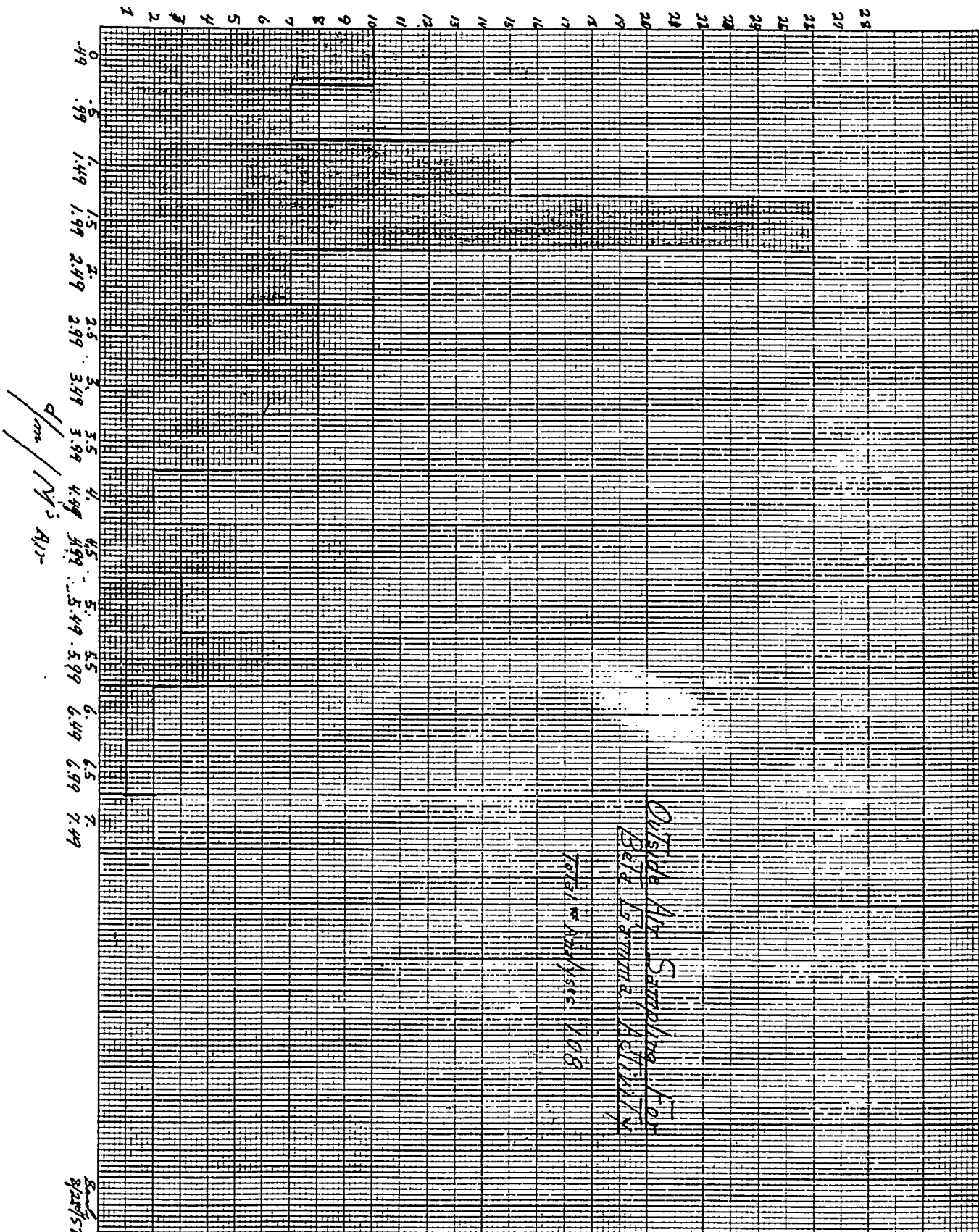
W. H. Baumann
Industrial Hygiene Section

MS:cs

Number of Samples



Number of Samples.



INTER-COMPANY CORRESPONDENCE

(INSERT NAME) COMPANY CARBIDE AND CARBON CHEMICALS COMPANY LOCATION Post Office Box P
OAK RIDGE, TENN.

TO Edw. G. Struxness
LOCATION Bldg. 9202
ATTENTION
COPY TO File ✓

DATE September 17, 1953

ANSWERING LETTER DATE

SUBJECT Level of Alpha Particulate
Contamination in Outdoor Air

Three air samplers are operated continuously starting with August 11th to present and the findings (concentration integrated over 24hrs.) are plotted daily on the accompanying chart. The location of the samplers is indicated on the graph.

It is evident that the general level of alpha particulate contamination is of a low order of magnitude. Actually no finding exceeded the AEC tentatively recommended value of 7 d/m/M³, the MPL for outside exposure.

We have discussed briefly the outdoor air sampling program in the Y-12 plant area; however, very little thought has been given to the instrumentation necessary to carry it out. It is my opinion, based partially on the following results, the complex, expensive recording continuous tape type monitors are not needed in our program. This is also supported, in part, by the type of the operations and processes carried on in this valley. It is highly unlikely that recording instruments reporting air concentration versus time (in short intervals) will give us anymore data than continuous type collecting samplers which would give us an integrated concentration over a 24 hr. period (or other shorter time interval). The latter instrument would have to be serviced daily and filter papers counted or analyzed as we now do with indoor samples.

If recording continuous tape monitors are selected, the sensitivity should be low so as not to detect or record alpha contamination in the range indicated on the graph for we are not concerned with this order of magnitude.

Mr. Sanders collected and plotted this data.

Original signed by W. H. Baumann

W. H. Baumann
Industrial Hygiene Section
Health Physics Department

WHB:cs

INTER-COMPANY CORRESPONDENCE

(INSERT NAME) COMPANY CARBIDE AND CARBON CHEMICALS COMPANY LOCATION Post Office Box P
OAK RIDGE, TENN.

TO
LOCATION Edw. G. Struxness, Y12RC
Bldg. 9202

DATE January 20, 1954

ANSWERING LETTER DATE

ATTENTION
COPY TO Paul C. McRee
File ✓

SUBJECT Air-borne Alpha Activity
Buildings 9201-4 and 9204-2

Air samples were taken in buildings 9201-4 and 9204-2 to determine the levels of a radio particulates during renovation by Rust Construction Company.

The results of the air samples (see attached table #1) reveal concentration well below the MPL of 70 d/m/M^3 (disintegration per minute per cubic meter of air).

For a more complete breakdown of the air analyses in relationship to operation and task being performed by Rust personnel, the air findings are listed in Table #2.

It was not feasible to take samples at the B. Z. of the operators; therefore, samples were taken about 15' to 20' away from the operations. With findings as indicated in Table 2, it is highly improbable that excessive contamination exists at the workers' breathing zone. In certain dusty operations, i. e., chipping concrete, water was used to suppress dust.

Original signed by W. H. Baumann

W. H. Baumann
Industrial Hygiene Section
Health Physics Department

WHB:MS:cs

Attachment

Table 1

Air-Borne Radioactivity Analyses

Location	Total Analyses	Average Concentration d/m/M ³	Highest Concentration d/m/M ³	Lowest Concentration d/m/M ³	No. Analyses Above MPL 70 d/m/M ³
204-2	44	5.3	23.0	0.0	0.0
201-4	30	2.4	14.1	.45	0.0

Table 2

Air Analyses of Radioactivity Dust in Relationship to Operations

Operation	U-Air Conc. d/m/M ³
Removing diffusion pumps	1.0
Cutting and removing pipe	2.7
Cutting and removing conduit	1.2
Cutting and removing pipe and chipping concrete	4.2
Removing coils from track	2.2
Cleaning equipment and fixtures	14.5
Chipping concrete	6.8
General air at B. L. near lunch room and wash room	.7

INTER-COMPANY CORRESPONDENCE

(INSERT NAME) COMPANY CARBIDE AND CARBON CHEMICALS COMPANY LOCATION Post Office Box P
OAK RIDGE, TENN.

TO G. B. Lockhart
LOCATION Building 9704-2

DATE January 22, 1954

ANSWERING LETTER DATE

ATTENTION
COPY TO Edw. G. Struxness, Y-22RC
File ✓

SUBJECT Air-Borne Activity in
Buildings 9201-4 and 9204-2

Enclosed is a copy of the summary report on the air samples taken in Buildings 9201-4 and 9204-2 during the week ending January 16, 1954 by the Industrial Hygiene Section of the Health Physics Department. You will notice that none of the 74 samples taken showed alpha concentration greater than 36% of the maximum permissible level.

Signed By
Paul C. McRee

Paul C. McRee
Contamination Control Section
Health Physics Department

PCM:cs

Enclosure

*Info Corp. to Struxness
1-20-54*

INTER-COMPANY CORRESPONDENCE

(INSERT NAME) COMPANY CARBIDE AND CARBON CHEMICALS COMPANY LOCATION Post Office Box P
OAK RIDGE, TENN.

TO Edw. G. Struxness, Y12RC
LOCATION Bldg. 9202

DATE March 11, 1954

ANSWERING LETTER DATE

ATTENTION

COPY TO File ✓

SUBJECT Forwarding Alpha
Contamination Report

I am forwarding herewith the report on alpha contamination in the analytical laboratory. Mr. Sanders did most of the work for this report as well as write it up.

Apparently, we have not uncovered anything startling during the course of accumulating the data. I think Mr. Sanders did a fine job in carrying out this assignment and presenting the material. The report shows, I believe, that Mr. Sanders has the initiative and is gaining considerably more job knowledge to justify his recent job status change.

W. H. Baumann
Industrial Hygiene Section
Health Physics Department

WHB:cs

INTER-COMPANY CORRESPONDENCE

(INSERT NAME) COMPANY CARBIDE AND CARBON CHEMICALS COMPANY LOCATION Post Office Box P
OAK RIDGE, TENN.

TO Edw. G. Struxness, Y12RC
LOCATION Bldg. 9202

DATE March 11, 1954

ANSWERING LETTER DATE

ATTENTION

COPY TO

File ✓

SUBJECT Alpha Contamination -
Health Physics Analytical
Lab

For the interim of August 1953 thru January 1954, a study has been made in an effort to determine the alpha air concentration in the environs of the Y-12 plant, and the occupational environment of the analytical laboratory in Building 9202. The following data is submitted for your consideration. Listed below are some points of interest which might be of service in interpreting the attached graphs.

A. Figure 1 - Outside Monthly Average of Alpha and Beta Concentration.

1. The beta concentration for the months of August and September, 1953 were some degree higher than normal background. (Possible explanation could be attributed to tests at Frenchman's Flat.)
2. The alpha concentration for the month of January, 1954 was excessively low. (Possible explanation could be excessive rainfall.)
3. There seems to be a decline in the beta activity since September 1953.

B. Figure 2 - Frequency Distribution of Alpha and Beta Air Analyses (Outdoors)

1. Alpha analysis - 79.5% were $< 0.49 \text{ d/m/M}^3$.
2. There seems to be a greater variation in beta activity.

C. Figure 3 - Analytical Laboratory Monthly Average of Alpha and Beta Concentration

1. The alpha concentration in the laboratory, and in the

outdoor environment seem to be of the same order of magnitude.

2. The inside and outside alpha air level for the month of January 1954 were the same (see Figures 3 and 1).

D. Figure 4 - Frequency Distribution of Alpha and Beta Air Analyses (Analytical Lab)

1. Alpha analysis - 66.8% were $< 0.49 \text{ d/m/M}^3$.
2. Beta analysis - 54.8% were $< 0.49 \text{ d/m/M}^3$ (Beta analysis was not started in analytical lab until December 1953.)

E. Figure 5 - Frequency Distribution of Alpha Analyses in Supply Air to Analytical Lab

1. Air samples were taken in the ducts handling supply air to the laboratory. Two samples which were taken before the cleaning operation of the supply ducts reveal concentrations as high as 11.3 d/m/M^3 of air. These findings are not listed in Figure 5.
2. Supply air alpha analysis - 64% were $< 0.49 \text{ d/m/M}^3$.

F. Figure 6 - Monthly Average of Smears

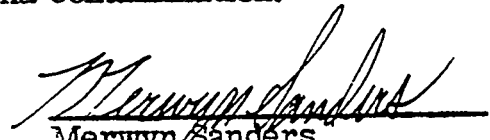
1. Smears were taken on the floor, inside hoods, top of the work tables and on settled dust in the analytical laboratory. Smear findings are of the same order of magnitude irrespective of type, i.e., floor, settled dust, working surface.
2. Smear findings for the month of November, 1953 seem to be in excess of the normal surface contamination. (Possible explanation could be the cleaning of supply ducts during this period).

In conclusion, the following remarks and recommendation are suggested.

1. All smear and air findings reveal concentrations of a low order of magnitude. During the latter months of 1953, and January, 1954, some correlation is evident between the outdoor and indoor (analytical lab) and alpha contamination levels.

March 11, 1954

2. A study is underway to determine the relationship, if any, of air contamination in the lab to uranium urine blanks. Current findings do not indicate any correlation.
3. A comparison of surface contamination in the analytical laboratory with other low activity areas - such as, the administration building, hospital, and cafeteria - indicates that smear averages in the analytical laboratory were higher by a factor of 10. For example, the analytical laboratory smear average for June, 1953 was 1.0 d/m/100cm² as compared to a corresponding average for the same period of 0.1 d/m/100cm² for the other areas described above.
4. Even though all findings indicate low levels of alpha contamination, the following practices and recommendations are suggested for use in the analytical laboratory as additional precautionary measures.
 - a. Filter supply air to the laboratory at the outlet registers. (It is my understanding, this is under consideration by Engineering Department.)
 - b. The area should be under a slight positive pressure. (Present findings indicate that the area is under a negative pressure - in flow is approximately 3500-4000 cubic feet per minute.)
 - c. The hoods should be balanced for more effective control of the air flow.
 - d. Foot traffic should always be kept to a minimum.
 - e. All material, including samples, coming from contaminated areas, should be checked for alpha contamination.


Merwyn Sanders
Industrial Hygiene Section

MS:cs

FIG. #1 Outside Air Sampling Program

■ - ALPHA
▨ - BETA

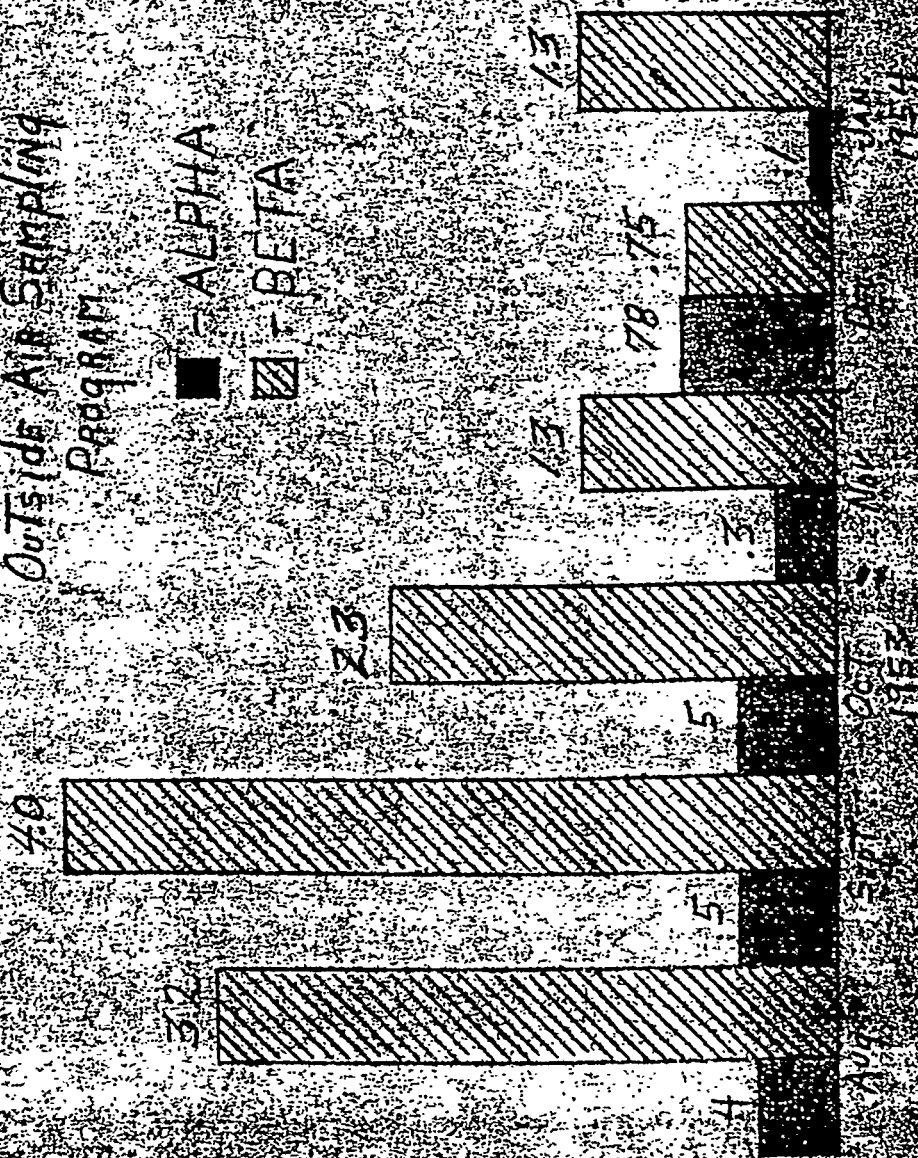


Fig. # 4

ANALYTICAL LAB.
AIR SAMPLING

■ - ALPHA
▨ - BETA

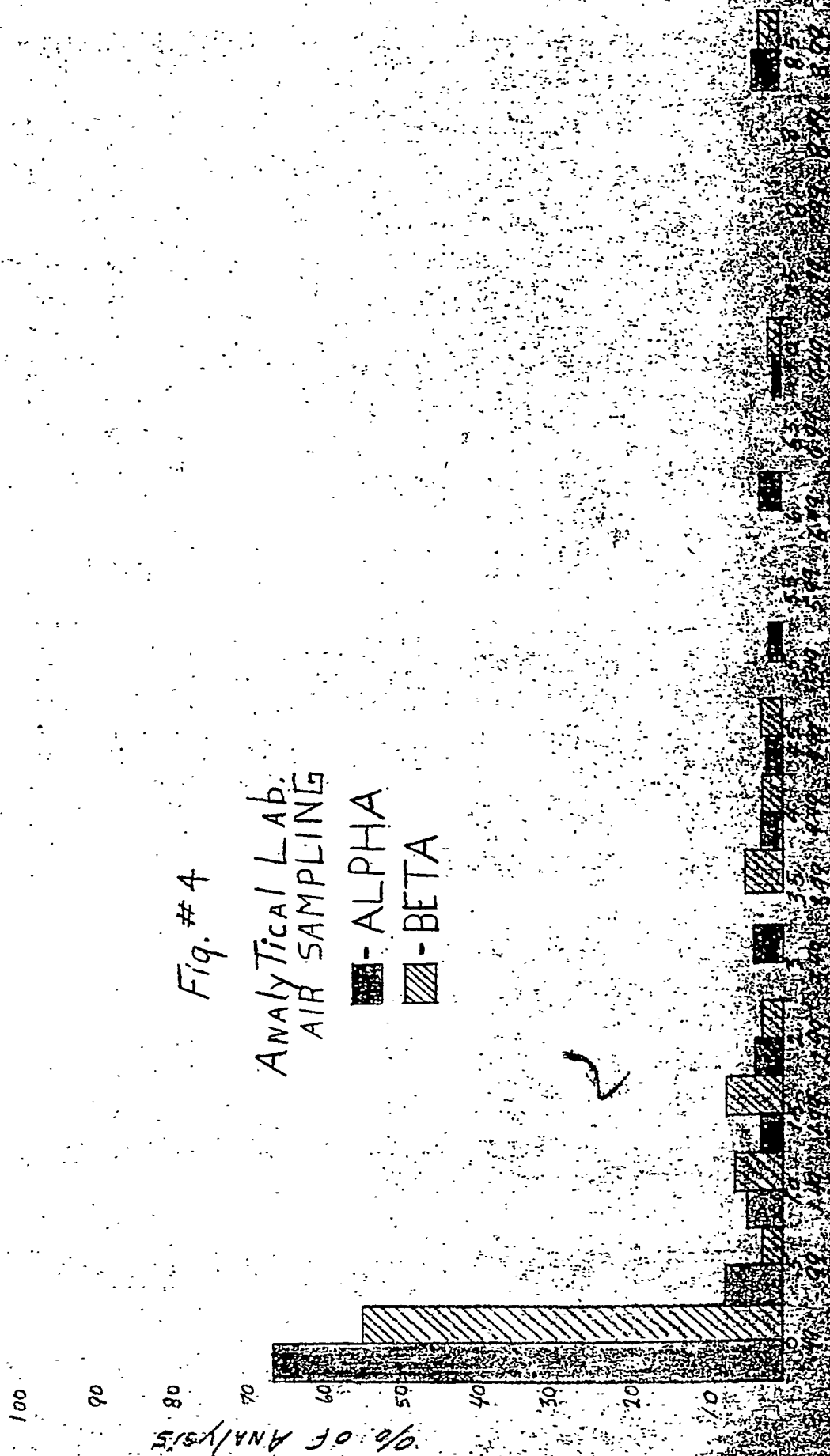


Fig #5
Supply Air Sampling
Analytical Lab.

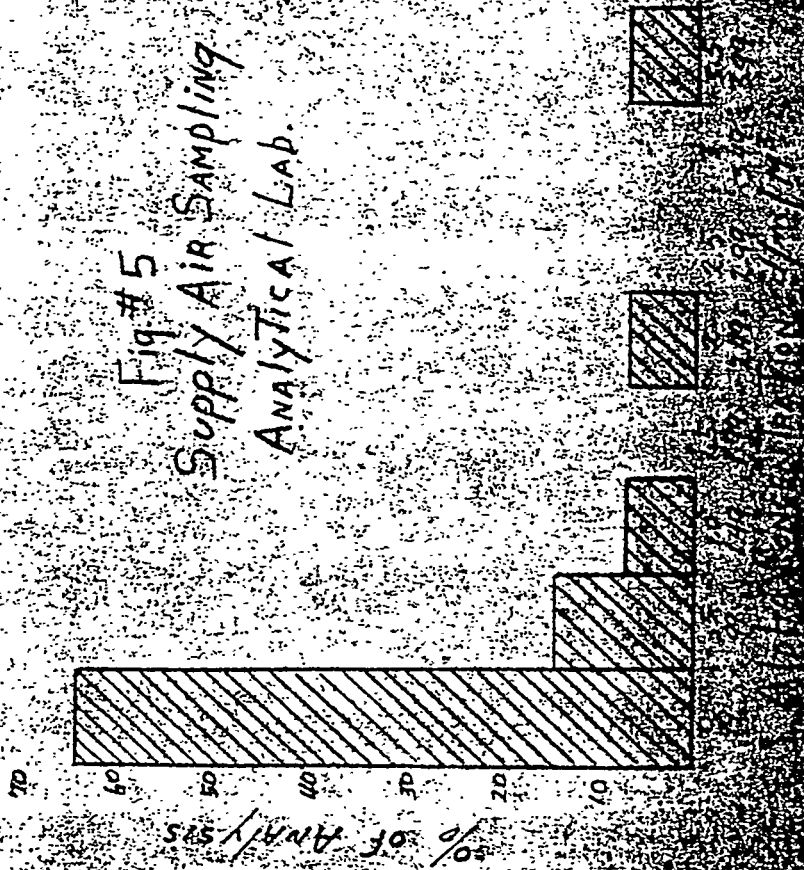
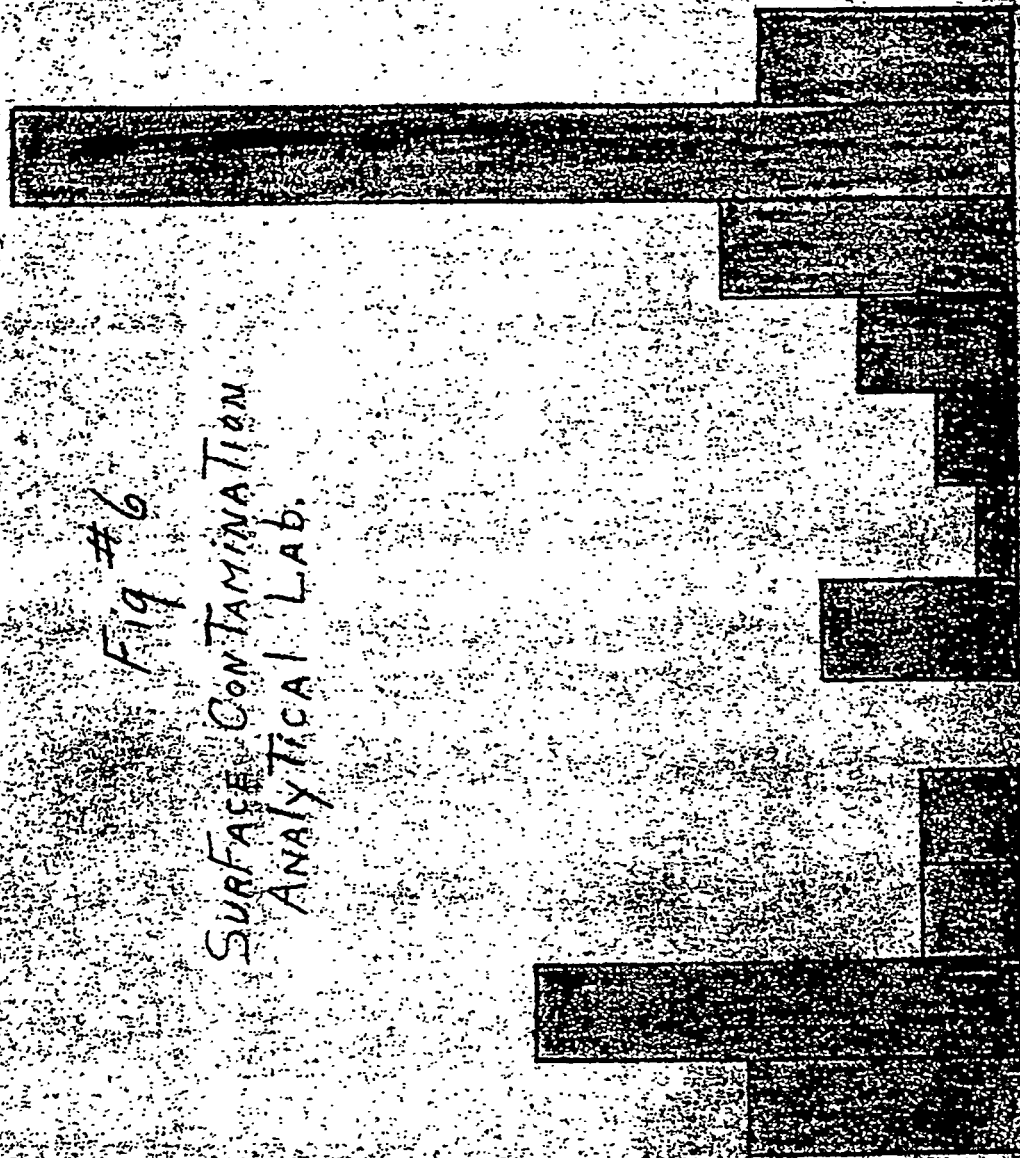


Fig #6
 SURFACE CONTAMINATION
 ANALYTICAL LAB.



ALPHA d/m/100 cm²

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ALPHA d/m/100 cm²